Maple 4.2.1

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Installing Maple 4.2.1

- This package contains:

  Maple 4.2.1 - Program Disk

  Library Disk 1

  Library Disk 2

  Library Disk 3 - Lib Source 1

  Library Disk 4 - Lib Source 2

  First Leaves for the Macintosh

  Maple Reference Manual

- The following assumes that your computer is running.
- Place the Maple 4.2.1 Program disk in a disk drive. Drag the Maple disk icon on to your hard disk. Acknowledge the warning about two different types of disks by clicking on the OK button. Eject the Maple Program disk.
- Place the Maple Library 1 disk in a disk drive. Double-click the Install Maple Lib 1 icon. Follow the on-screen directions. You will be prompted for the Maple Library 2 disk during the installation process. Eject the Maple Lib 1 disk.
- Note: The source code files provided on the Lib Source 1 and Lib Source 2 disks are for reference only and are not actively used by the Maple system. These files will use about 2.5 megabytes of space on your hard disk. If you elect not to install them, skip the remainder of this step.

  Place the Lib Source 1 disk in a disk drive. Double-click the Install Lib Source 1 icon. Follow the on screen directions. You will be prompted for the Lib Source 2 disk during the installation process. Eject the Lib Source 1 disk.

- Open the Maple folder on your hard disk. This folder should now contain:

  Kernels - a folder that contains Maple 4.2.1 (for use with any Macintosh) and Maple II (for use with Mac II's or SE 30's)

  OPEN ME - a session document that provides an introduction to Maple use

  Basic Help - a text document that Maple will use in the event that you appear to be having trouble (see *Pop-Up Help* on page 6)

  Examples 4.2.1 - a folder of examples revised to make use of some of the new features in 4.2.1

  Lib - the Maple Library

  Lib Sources - source code for routines in the Maple Library

- Drag either Maple 4.2.1 Plus/SE or Maple 4.2.1 II/SE30 out of the Kernels folder. Close and discard (Trash) the Kernels folder and the unused kernel. You may rename the kernel you have selected simply Maple if you desire.

- If you are using Multifinder and if you have more than two megabytes of RAM, you may increase the default memory partition that Maple will use. This can be accomplished as follows: Select the Maple kernel; choose Get Info (from the File menu); edit the Application Memory Size in the box in the lower right corner of the Info window. Specifying a larger partition will increase the number of Maple commands that can be performed in one session.

- Start Maple by double-clicking on the Maple kernel you have elected to use. You will be prompted to personalize your copy of Maple.

- If you encounter difficulty or have questions, call Software Support at Brooks/Cole, 408-373-0728.

New in Maple 4.2.1

- New prompts: • and »

  The former > prompt is now replaced by two prompts: the primary prompt • and the secondary prompt ».

  The primary prompt is produced when Maple is ready for a new expression to be entered for evaluation. If all of your input expressions are short, one-line expressions, you will see the primary prompt exclusively.

  The secondary prompt is used when a partial expression or statement has been entered and Maple is waiting for you to enter the rest of the expression before it can proceed. A common omission is for users to forget the ';' statement terminator that signals the end of a Maple expression or statement. When this omission occurs, the secondary prompt will appear and will serve as a reminder that the statement needs to be terminated.

  Here's an example:

  • `a+` (user presses `a`, `+`, and *enter* keys)

  » `4^2` (user presses `4`, `^`, `2`, and *enter* keys)

  » `;` (user presses ; and *enter* keys)

  `a + 16` (Maple produces result)

  • (Maple shows primary prompt for next expression)

  Note: Once the secondary prompt is issued, Maple appends all entries (including any edited version of a line that is reentered) until the ; is entered.

  With Maple 4.2, it was necessary to avoid typing on the same line as the prompt since pressing the *enter* key normally read all the characters on the line, including the prompt, for evaluation by Maple. With Maple 4.2.1, this isn't necessary. Maple now will remove any string of prompt characters at the beginning of a line before evaluation.

Prompts do not appear if you type a line and then press the *return* key. You may type and edit any number of lines containing Maple expressions, ordinary text, or both by using the *return* key as you type. Nothing is read by Maple for evaluation and hence no prompt is produced until you use the *enter* key to enter exactly those lines that you want evaluated.

- Easy access to on-line help information

  In addition to being able to see on-line help documentation via Maple's help function (e.g., by typing `help(integration);`), there is now a Help menu. Some of the menu items display a window of information for the appropriate item. Others produce a synopsis dialog box.

  The synopsis dialog box is a powerful aid in learning about Maple. Each dialog box contains a list of related topics in alphabetical order. You can scroll through the list to look for a topic. You can also type the first few letters of a topic and that topic will be selected almost instantly. As a topic is selected, either because you have clicked the topic name in the list or because you have typed the first few letters of the topic, a synopsis for that topic is immediately shown in the dialog box.

  If you click on a topic in the list and then drag through the list while keeping the mouse button pressed, topics are selected in turn. As the cursor passes over a topic, its synopsis is presented. The list will scroll automatically when you try to drag through the top or the bottom of the list.

  When a topic is selected and its synopsis shown, you can press the **OK** dialog button (or press the *return* key) to see the complete on-line documentation for the topic in a help window.

  The following items are available on the Help menu:

  Introduction

  > This displays a brief introduction to the Maple symbolic mathematics system. Through a few examples, which are necessarily brief, the power of Maple is shown.

Basics

This displays some general tips and hints about using Maple on the Macintosh.

General

This produces a submenu that shows entries for "Expressions," "Statements," "Tables," "Datatypes," and "Packages." Selecting any of these categories brings up a help page that displays topics related to these categories.

Syntax

This displays two submenus: one for Maple expressions and one for Maple statements. Choosing Expressions brings up a synopsis dialog box with a list of topics related to Maple expressions such as Maple operators or Maple datatypes. Choosing Statements brings up a synopsis dialog box with a list of Maple statement types.

Library Fcns

This displays the synopsis dialog box, which lists most of the important functions that are in the Maple library. By perusing this extensive list, you can get a good idea of the capabilities of Maple.

Packages

This displays a submenu showing all the packages that are available in the Maple library. Selecting a particular package will produce a synopsis dialog that lists functions and topics that are germane to the package.

Maple topic ...

This displays a dialog box that allows you to type any arbitrary topic. If there is help information for this topic, Maple will produce a help page for the topic.

Help for selection

When some text is selected (and hence highlighted) in a Maple window, this menu item brings up a help page for the selected topic if such information is available. For example, if one of your examples contains the word dsolve (the command for solving differential equations) and you want more information about dsolve,

select the word dsolve in your window, and then use the "Help for selection" menu item.

A convenient shortcut is to select the topic by double-clicking on a word and then using the command-H key combination, which is the command key shortcut for "Help for selection."

This shortcut is especially useful within a help page to bring up information about a topic mentioned in a related help page. New users of Maple can learn quickly about the system by using this shortcut as a fast link from one topic to an associated topic.

- Pop-up help

New users of Maple on the Macintosh may not be aware of the distinction between using the *return* key for editing in a window and the *enter* key for performing a calculation. This is explained in *First Leaves for the Macintosh*, which users may or may not have read. Novices may very well type a Maple expression, press *return*, and then wait indefinitely (or until they are definitely annoyed) for results of a calculation to appear.

Maple 4.2.1 asks the user if help is needed when the *return* key is pressed and then no further typing or use of the mouse follows after a long pause. In response to an affirmative answer, the basic help information is presented. The user can also instruct Maple not to offer help during subsequent pauses.

- Maple variables can be cleared easily

It is sometimes useful to completely erase previous Maple results and to start again with essentially a new session. This can be done now by using the new "Clear Maple variables" menu item in the Commands menu. It erases the values of all the Maple variables but leaves all the text windows (file windows and the worksheet) intact.

This can be useful when you step through a sequence of calculations and then want to redo all the calculations using a variation on one of the intermediate steps. It can also be done by saving the worksheet into a text file, quitting Maple, relaunching Maple using the text file as the new worksheet, and then editing the worksheet. However, clearing the Maple variables is faster and easier.

- Maple statements and procedures can be formatted automatically

  The Typing Preferences dialog allows you to have multi-line statements or procedures indented automatically. If you check the "Indent automatically" box, the blinking insertion bar is positioned on the next line underneath the beginning of the previous line when you press the *return* key. This feature allows you to type properly indented nested statements and procedures almost without effort.

  In addition, the "Expand Tabs" check box, which is also in the Typing Preferences dialog, gives you the ability to use the *tab* key to insert the correct number of blanks in your statements so that the insertion point is moved to the next tab setting. The use of tab expansion makes it easy to move to the next indentation level in a nested Maple statement.

  The number of spaces between tab stops can be changed in the Typing Preferences dialog.

  Tabbing is also supported by the following key combinations:

option-left arrow	Move backward to the previous tab stop
option-right arrow	Move forward to the next tab stop
option-delete	Delete backward to the previous tab stop

  Automatic indentation and tabbing are useful not only for typing Maple statements but also for generating an outline or any other document in which indentation occurs.

- Optional output separator lines

  Through a check box in the Output Preferences dialog, you can have Maple produce a separator line after each complete result is displayed by Maple. This has the effect of visually grouping input and output text within the window.

  The separator lines may be removed from the window through the menu command "Remove separator lines" in the Commands menu.

- Optional replace output mode

  Through a check box in the Output Preferences dialog, you can turn on or off Maple's replacement mode. This option is useful if you move

back to a previous Maple input expression, edit it, and then wish to perform the calculation again.

When the entire input expression is selected and then entered by 1) leaving the blinking insertion bar anywhere on a single-line expression and pressing the *enter* key or by 2) clicking at the beginning of a multi-line expression, dragging over the multiple lines to select them, and then pressing the *enter* key, the following takes place:

a) If the replacement mode is turned off (the default), then the new results are inserted in the window after the input and before the old output results.

b) If the replacement mode is turned on, then the old output results, following the input expression, are erased and replaced by the new output results.

   Erasure of output proceeds from the first line following the input expression and continues to the next line that starts with a prompt, a Maple comment symbol (#), or an output separator line.

- Session settings can be saved in a MapleInit file

  If you have changed any of the session settings using the Settings menu, when you quit Maple you will be given the chance to save these settings into a MapleInit file. This file can be either in the Maple application folder or in your System folder, according to your selection in a dialog box that appears at the end of your session.

  The MapleInit file is an ordinary text file, with the session settings saved in its resource fork. Using either Maple itself or a text editor, you can open this MapleInit file and enter Maple commands into the text file.

  When Maple is launched, it looks for a MapleInit file in the same folder as the Maple program. If one is present, it uses any settings stored in the file's resource fork to define the session settings. It also executes any Maple commands that are contained in the file. Then it looks for a MapleInit file in the System folder and does likewise.

  In a shared environment, e.g., using AppleShare, system-wide initialization statements and settings can be placed in the MapleInit file in the Maple application folder. These can then be augmented or

overridden by further initialization statements and settings stored in a MapleInit file in an individual's system folder.

- Worksheets

  Worksheets, or Maple session windows, may now be Saved, Closed, and Opened. Existing text files may be opened as worksheets. For Maple to perform computations, there must always be an open worksheet. A worksheet window is different from a file window in that computation results are always placed in the worksheet. Both file windows and the worksheet window may have their results saved in a text file.

  WARNING: Attempting to open a file window without an open worksheet window will cause Maple to quit. Be sure you have an open worksheet window before you attempt other operations.

  The Maple program can be launched by double-clicking on any Maple document, either a Maple text file, a Maple plot file, or a Maple binary file. Double-clicking on a text file will launch Maple with that file used as the worksheet.

- Better support for international keyboards

  Some keyboards use option-key combinations to generate characters that are used by Maple. This is now supported by Maple 4.2.1.

- Library location can be defined easily

  For most users of Maple, the location of the Maple library folder does not present a problem. If you followed the suggested installation of Maple on your hard disk as outlined in *First Leaves for the Macintosh*, then both the Maple program and the Maple library folder will be contained in the same folder on your hard disk and Maple will have no problems finding the library. In that case, the rest of this section will not be important to you.

  If you do install the Maple library in another location, you need to make this location known to Maple. Although Maple can be used if it

cannot access its library, you will find that its mathematical capabilities are severely limited. To set the library location:

a) Select the "Library location" menu item under the "Settings" menu.

b) You will see a variation of the standard file dialog that allows you to select disk volumes and to move in to and out of folders on your disk(s). Use this to locate the Maple library folder.

c) When you do locate the Maple library folder, the **Select** button in the dialog will be highlighted automatically.

d) Either press the *return* key or click on the **Select** button to confirm that this is indeed the Maple library folder.

Once the location of the Maple library has been redefined, when you quit Maple you will be given the chance to save this library setting in an initialization file so that you won't have to locate the library again during your next use of Maple.

Access to the library is crucial for many Maple commands to work correctly and also for the on-line help system to function. If the library-location setting is incorrect when Maple is started, you will be warned about this and you should then help Maple locate the library folder.

- Larger range of sizes available for fonts

In anticipation of Apple's new outline fonts in the upcoming System 7.0 software or if you are using Adobe's outline fonts in the Adobe Type Manager, you may select an arbitrary font size through the Custom Size menu item in the Font menu.

If you are not using the Adobe Type Manager or System 7.0's new outline fonts, you should leave font scaling disabled. A check box to control font scaling can be found in the Output Preferences dialog.

- Zoom box and color capability added to plot windows

  The addition of a zoom box in the upper right corner of a plot window allows you to quickly resize a plot window to the full size allowed by your screen and then subsequently to zoom back to its former size.

  In addition, on color monitors different functions plotted within the same plot window may use color to distinguish between the curves. If no choices are made in the Maple plot command, then multiple functions are automatically plotted in different colors within a selection of seven colors.

- New editing convenience

  Pressing the command-delete key combination deletes all text in a window from the insertion point to the end of the text in the window.

- New shortcuts

  Close all open file windows

  The option-command-W key combination closes all file windows, whereas command-W closes just the active file window. If changes have been made in any of the file windows, you will be given a chance to save the new contents into the file.

  Close a file window quickly

  The shift-command-W key combination closes the active file window without bothering to ask if you want to save the file, even if the window contents have changed.

  Close all file windows quickly

  The shift-option-command-W key combination closes all open file windows without asking if any of these window contents are to be saved in their respective files.

  Quit quickly.

  The shift-command-Q combination quits Maple without asking if any of the file windows are to be saved, without asking if the worksheet is to be saved, and without asking if any changed session settings are to be saved.

- Status window has been moved

  The status window, which shows computation resource usage, has been moved to the right side of the screen so that it doesn't obscure information on the left side of the screen. Moreover, it is now placed behind the worksheet when the session starts. You can use the Windows menu to bring it quickly to the top and to move the status window to whatever location suits you.

- Warning given if a text window is becoming full

  There is a limit of 32,768 characters that can be placed in a file window or in a worksheet window. When the amount of data in one of these windows approaches this limit, a warning is given. At that point, it is advisable to pare away unnecessary text or to save the results in a file and then to reduce the amount of data in the window.

- The "Terminate entire session" menu command was deleted

  You should use the File menu item Quit instead to leave Maple. The quit command gives you the chance to save the worksheet, any file windows that have been changed, and the session settings if they have changed.

- New and revised functions within the `student`

  You may test the `student` package by generating the following sample session:

```
• with(student);
[Int, isolate, changevar, rhs, showtangent,

   Limit, combine, distance, Eval, makeproc,

   value, rightbox, rightsum, midpoint, Sum,

   leftbox, maximize, D, minimize, lhs,

   leftsum, trapezoid, powsubs, intparts,

   intercept, slope, simpson, cmpltsq]
```

```
• lhs(a=b);
                    a
• rhs(a=b);
                    b

• cmpltsq(x^2 - 3*x + 5 , x);

                      2
             (x - 3/2)  + 11/4

• leftsum(",x=0..4);
              3
            -----
             \                 2
              )    ((i - 3/2)  + 11/4)
             /
            -----
            i = 0

• value(");
                    16

• simpson(f(x),x=0..1);

1/12 f(0) + 1/12 f(1)

              2
            -----
             \
   + 1/3 (    )    f(1/2 i - 1/4))
             /
            -----
            i = 1

              1
            -----
             \
   + 1/6 (    )    f(1/2 i))
             /
            -----
            i = 1
```

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